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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,359	08/19/2003	Ning An	50277-1068	4851

23517 7590 09/24/2007

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EXAMINER	
CAO, PHUONG THAO	

ART UNIT	PAPER NUMBER
2164	

MAIL DATE	DELIVERY MODE
09/24/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/643,359	AN ET AL.	
	Examiner	Art Unit	
	Phuong-Thao Cao	2164	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 June 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,4,6-12,14,15 and 18-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,4,6-12,14,15 and 18-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to Amendment filed on 06/27/2007 and entered with an RCE.

2. Claims 1, 3, 4, 6-12, 14, 15 and 18-20 have been amended, and claims 2, 5, 13, 16 and 17 were previously cancelled. Currently, claims 1, 3, 4, 6-12, 14, 15 and 18-20 are pending.

Continued Examination Under 37 CFR 1.114

3. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 06/27/2007 has been entered.

Response to Amendment

4. Amendments to dependent claims 3, 4, 7-12 and 15 are effective to overcome the claim objection in the previous office action. Therefore, the claim objection in the previous office action has been withdrawn.

Response to Arguments

5. Applicant's arguments with respect to claims 1, 3, 4, 6-12, 14, 15 and 18-20 have been considered but are moot in view of the new ground(s) of rejection.

Specification

6. The disclosure is objected to because of the following informalities:

Section Related Applications (paragraph [01]) in the specification includes personal or individual information (e.g., attorney docket number), which should be removed. Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claim 19 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: "selecting" step. According to previous amendment, claim 19

is a "medium" claim storing instructions, which perform method of claim 6. It is believed that the "selecting" step is left out by mistake.

9. Claims 1, 6, 12 and 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the node" in line 7. There is insufficient antecedent basis for this limitation in the claim.

As to claim 6, the phrase "selected children include distributed within" (line 4) is unclear.

Claim 12 recites the limitation "the objects" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 14 recites the limitation "the cluster node" in line 7. There is insufficient antecedent basis for this limitation in the claim.

Claim 19 recites the limitation "the selected children" in line 4. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 3-4, 6-12, 14-15 and 18-20 (effective filing date 5/15/2003) as best understood by Examiner are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. ("Merging R-Trees: Efficient Strategies for Local Bulk Insertion", GeoInformatica: March 2002) in view of Guttman ("R-Trees: A Dynamic Index Structure for Spatial Searching", AMC: 1984).

As to claim 1, Chen et al. teach:

"A method of inserting a plurality of entries into an existing index keyed by multidimensional data" (see Chen et al., Abstract) comprising:

"selecting nodes of the index each having entries and that overlap if the plurality of entries are inserted into a first one of the nodes of the index, wherein the selected nodes of the index are sibling nodes" (see Chen et al., [page 14, paragraph 2] for selecting sibling nodes to merge);

"inserting the entries within the first one of the nodes of the index" (see Chen et al., [page 11, Figure 1] for inserting small tree (entries) within a node of the big tree (index));

"partitioning the entries of the first one of the node into groups to reduce overlap, wherein each group of entries corresponds to a partitioned node of the index" (see Chen et al., [page 11, Figure 1] wherein nodes in the small tree is interpreted as groups of entries; also see [page 14, paragraph 2] wherein the technique of splitting node is also interpreted as partitioning); and

"reorganizing a second one of the nodes of the index and the partitioned nodes" (see Chen et al., [page 14, paragraphs 1-2] for reorganizing the index including splitting node which create partitioned nodes, and merging sibling nodes).

However, Chen et al. does not explicitly teach:

"wherein said reorganizing includes reorganizing the entries in each of the second one of the nodes and the partitioned nodes such that an amount of overlap is reduced".

On the other hand, Guttman teaches:

"wherein said reorganizing includes reorganizing the entries in each of the second one of the nodes and the partitioned nodes such that an amount of overlap is reduced" (see Guttman, [page 51, column 1, paragraph started with "The procedure outlined..."] wherein distributing entries among sibling nodes is interpreted as reorganizing entries in nodes; also see [page 51, column 2] for node splitting as a way to reorganize entries in partitioned nodes as claimed).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to incorporate the teaching of Guttman into Chen et al.'s system. A skilled artisan would have been motivated to do so as suggested by Guttman (see Abstract) to provide a dynamic index structure (R-tree) with effective algorithms (i.e., reorganization techniques) for searching and updating the spatial database. Both of the references (Chen et al. and Guttman)

teaches features that are directed to analogous art and they are directed to the same field of endeavor, such as, index structure for spatial data, R-tree, insertion of data into the index structure, and node merging and splitting. This close relation between both of the references highly suggests an expectation of success.

As to claim 3, this claim is rejected based on arguments given above for rejected claim 1 and is similarly rejected including the following:

Chen et al. and Guttman teach:

"the entries include spatial data" (see Chen et al., [page 7, paragraph 2]); and

"the index keyed by multidimensional data includes a spatial index" (see Chen et al., [page 7, paragraph 2] and [page 11, Figure 1] for R-tree as a index).

As to claim 4, this claim is rejected based on arguments given above for rejected claim 1 and is similarly rejected including the following:

Chen et al. and Guttman teach:

"wherein sibling nodes are for an R-Tree index" (see Chen et al., [page 11, Figure 1] and [page 14, paragraph 2]).

As to claim 6, Chen et al. teach:

"A method of inserting a plurality of entries into an existing spatial index" (see Chen et al., [page 8, paragraph 3] wherein R-tree is a spatial index) comprising:

"selecting at least two and less than all children of a node in the spatial index, the selected children include distributed within" (see Chen et al., [page 14, paragraph 2] for selecting sibling nodes to merge);

"distributing the entries within a first one of the selected children" (Chen et al., [page 11, paragraph 1 and Figure 1] for inserting the small tree (entries) into one entry of a selected node wherein a selected node including many entries, each entry represents one of children of the selected node and wherein entries in the small tree is distributed in nodes as groups of entries);

"partitioning the entries of the first one of the selected children into groups to reduce overlap, wherein each group of entries corresponds to a partitioned child of the index" (Chen et al., [page 11, paragraph 1 and Figure 1] wherein entries of the small tree is interpreted as entries of the one of the selected children, each node in the small tree is interpreted as group of entries or partitioned child of the index); and

"reorganizing the partitioned children and a second one of the selected children" (see Chen et al., [page 14, paragraphs 1-2] for reorganizing the index including splitting node which create partitioned nodes, and merging sibling nodes).

However, Chen et al. does not explicitly teach:

"wherein said reorganizing includes reorganizing the distribution of entries in each of the second one of the selected children and the partitioned children".

On the other hand, Guttman teaches:

"wherein said reorganizing includes reorganizing the distribution of entries in each of the second one of the selected children and the partitioned children" (see Guttman, [page 51, column 1, paragraph started with "The procedure outlined..."] wherein distributing entries among sibling

nodes is interpreted as reorganizing entries in nodes; also see [page 51, column 2] for node splitting as a way to reorganize entries in partitioned nodes as claimed).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to incorporate the teaching of Guttman into Chen et al.'s system. A skilled artisan would have been motivated to do so as suggested by Guttman (see Abstract) to provide a dynamic index structure (R-tree) with effective algorithms (i.e., reorganization techniques) for searching and updating the spatial database. Both of the references (Chen et al. and Guttman) teaches features that are directed to analogous art and they are directed to the same field of endeavor, such as, index structure for spatial data, R-tree, insertion of data into the index structure, and node merging and splitting. This close relation between both of the references highly suggests an expectation of success.

As to claim 7, this claim is rejected based on arguments given above for rejected claim 6 and is similarly rejected, including the following:

Chen et al. and Guttman teach:

"wherein said organizing includes reorganizing such that an amount of overlap of bounding boxes for objects in the spatial index is reduced" (see Chen et al., [page 7, paragraph 2] for handling overlapping regions; also see Guttman, [page 50, column 1] for algorithm AdjustTree to reduce overlap by adjusting covering rectangles or bounding boxes).

As to claim 8, this claim is rejected based on arguments given above for rejected claim 7 and is similarly rejected including the following:

Chen et al. and Guttman teach:

"wherein one of the bounding boxes includes a minimum bounding rectangle (MBR)" (see Chen et al., [page 10, paragraph 2] and [page 11, paragraph 2]).

As to claim 9, this claim is rejected based on arguments given above for rejected claim 6 and is similarly rejected including the following:

Chen et al. and Guttman teach:

"wherein at least two of the selected children have respective bounding boxes that overlap with one another" (see Chen et al., [page 10, paragraph 2] and [page14, paragraphs 1-2]; also see Guttman, [page 51, column 1]).

As to claim 10, this claim is rejected based on arguments given above for rejected claim 6 and is similarly rejected including the following:

Chen et al. and Guttman teach:

"wherein said selecting includes selecting exactly two of the children" (see Chen et al., [page 14, paragraph 2] discloses the merging of the two closest sibling nodes in order to leave an entry slot for the small tree root, this implies the selection of two sibling nodes, as illustrated in Applicant's claim language).

As to claim 11, this claim is rejected based on arguments given above for rejected claim 10 and is similarly rejected including the following:

Chen et al. and Guttman teach:

"wherein the exactly two of the children have respective bounding box that overlap with one another" (see Chen et al., [page 10, paragraph 2] and [page 14, paragraph 2]).

As to claim 12, this claim is rejected based on arguments given above for rejected claim 6 and is similarly rejected including the following:

Chen et al. and Guttman teach:

"wherein the objects distributed among the selecting children include the entries" (see Chen et al., [page 10, paragraph 3] wherein "sets of data" is equivalent to Applicant's "entries"; also see [page 14, paragraph 4]).

As to claim 14, Chen et al. teach:

"A method for inserting a plurality of entries into an existing multidimensional-keyed index organized as an R-Tree" (see Chen et al., [page 8, paragraphs 2-3] and [page 11, Figure 1]), comprising:

"associating a node in the R-tree with a buddy node that is a sibling of the node" (see Chen et al., [page 14, paragraphs 1-2] for merging of sibling nodes);

"clustering children of the node and children of the buddy" (see Chen et al., [page 14, paragraph 2] wherein the merge indicates the combination of children of merged nodes);

"partitioning the clustered children and the entries into a plurality of groups, wherein at least one of the groups includes a child node of the cluster node, a buddy child node associated the child node, and one or more of the entries, said partition is performed so that overlap among bounding boxes associated with the groups is reduced" (see Chen et al., [page 11, Figure 1]

wherein nodes in the small tree is interpreted as groups of entries; also see [page 14, paragraph 2] for the technique of splitting node which indicates the partitioning a node (cluster node) into a plurality of nodes and the combination of splitting and merging can result in at least one of the groups as recited); and

"reorganizing the child node and the buddy child node associated with the child node" (see Chen et al., [page 14, paragraphs 1-2] for reorganizing the index including splitting node which create partitioned nodes, and merging sibling nodes)

However, Chen et al. does not explicitly teach:

"inserting said one or more of the entries among child node and the buddy child node associated the child node"; and

"wherein said reorganizing includes reorganizing the distribution of entries in each of the child node and the buddy child node associated with the child node".

On the other hand, Guttman teaches:

"inserting said one or more of the entries among child node and the buddy child node associated the child node" (see Guttman, [page 51, column 1, paragraph started with "The procedure outlined..."] for inserting entries among sibling nodes); and

"wherein said reorganizing includes reorganizing the distribution of entries in each of the child node and the buddy child node associated with the child node" (see Guttman, [page 51, column 1, paragraph started with "The procedure outlined..."] wherein distributing entries among sibling nodes is interpreted as reorganizing entries in nodes; also see [page 51, column 2] for node splitting as a way to reorganize entries in partitioned nodes as claimed).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to incorporate the teaching of Guttman into Chen et al.'s system. A skilled artisan would have been motivated to do so as suggested by Guttman (see Abstract) to provide a dynamic index structure (R-tree) with effective algorithms (i.e., reorganization techniques) for searching and updating the spatial database. Both of the references (Chen et al. and Guttman) teaches features that are directed to analogous art and they are directed to the same field of endeavor, such as, index structure for spatial data, R-tree, insertion of data into the index structure, and node merging and splitting. This close relation between both of the references highly suggests an expectation of success.

As to claim 15, this claim is rejected based on arguments given above for rejected claim 14 and is similarly rejected including the following:

Chen et al. and Guttman teach:

"each node of the R-tree is associated with a respective bounding box" (see Chen et al., [page 11, paragraph 2] for MBR of each node); and

"a first bounding box associated with the child node overlap a second bounding box associated with the buddy child node" (see Chen et al., [page 10, paragraph 2] for overlapping between the sibling MBRs).

As to claim 18, this claim is rejected based on arguments given above for rejected claim 1 and similarly rejected.

As to claim 19, this claim is rejected based on arguments given above for rejected claims 6 and 7 and similarly rejected.

As to claim 20, this claim is rejected based on arguments given above for rejected claim 14 and similarly rejected.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuong-Thao Cao whose telephone number is (571) 272-2735. The examiner can normally be reached on 8:30 AM - 5:00 PM (Mon - Fri).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Rones can be reached on (571) 272-4085. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Phuong-Thao Cao
Art Unit 2164
September 13, 2007

C. Rones

CHARLES RONES
SUPERVISORY PATENT EXAMINER